

Docket No.: 03-09:US

REMARKS

This is a response to the Office Action mailed June 18, 2004. Claims 1-18 have been pending in the present application. Claims 1-6 and 8-15 have been rejected and claims 7 and 16-18 have been objected to. The drawings and specification were objected to due to certain inconsistencies between them. The Applicants made appropriate corrections to the drawings and specification, and amended claims 7 and 16 to clearly define the invention of the subject application. Reconsideration of rejections and objections is respectfully requested.

Drawings

The Examiner objected to Figures 6A, 6B, 7A, 7B and 8A due to inconsistency between the specification relating to written description of these drawings.

Figures 6A and 6B have been objected to since the respective groups of components 21,22, 23 and 45,47Cs, 48Cm, 49, 50 were not mentioned in the specification. Figures 7A and 7B have been objected to since the respective groups of components 111, 131, 21,22,23 and 45Cs, 48Cm, 50 were not mentioned in the specification. Figure 6 was further objected to due to wrong reference to capacitor component 32 in the specification. Figure 8A was objected to because the components 11,31,33 and 21,22, and 23 were not mentioned in the specification.

Figures 8B and 9B were objected to since the respective groups of components 11, 13, 31, 33, 37, 45, 46Ct, 47Cs, 48Cm, 49, 50 and 11, 31, 33, 21, 22, 23.

The appropriate corrections are made to the specification: the description of the components identified above was added to the description of Figures 6A, 6B, 7A, 7B and 8A. Please see section "Specification" of this document. The reference to capacitor 31 in the description to Fig. 7b was changed to capacitor 32.

The following corrections have been made to the drawings:

in Figure 5 (Sheet 3/5) the labeling "NMR COIL" next to number 45 has been deleted;

in Figures 8B and 9B (Sheet 5/5) the labeling 13 has been changed to 12.

Replacement sheets 3/5 and 5/5 are submitted herewith according to the Examiner's request.

No new matter is introduced.

The Applicants respectfully request to withdraw the objections to the drawings.

Docket No.: 03-09 US**Specification**

The Applicants made the correction to the specification according to observations made by the Examiner. The elements of the subject invention shown in the drawings were cited in the specification to confirm the description of the invention to the drawings. No new matter has been introduced. The Applicants respectfully request to withdraw the objections to the specification.

Claim Objections

The Examiner objected to claims 7 and 16 for certain informalities. Claims 7 and 16 were amended according to suggestions made by the Examiner. It is respectfully requested to withdraw the objections to these claims.

Claim Rejections - 35 U.S.C. § 102

The Examiner rejected claims 1-5, and 8-9 under 35 U.S.C. § 102(b) as being anticipated by Munsell et al (the US patent No. 5,982,179).

With respect to rejected claims, the Examiner lists claimed element of the subject invention and cite corresponding teaching in the Munsell et al patent. The Applicant respectfully disagrees with the rejection for the following reasons.

There is fundamental difference between Munsell's teaching and the teaching of the present invention. Muncell's NMR circuit switch design does not have an adjustable $\frac{1}{4}$ wave assembly that has a capability to adjust the tune frequencies of any given wand. According to Muncell's invention it is necessary to change capacitor sticks for different single tune frequencies, and it is necessary to change the $\frac{1}{4}$ wave stick or a $\frac{1}{4}$ wave extension stick for different double tune frequencies.

According to the present invention, the same $\frac{1}{4}$ wave wand may be used for all the tune frequencies by changing a capacitor in a spring clip and changing the position of the sliding shorting stub.

Referring specifically to claim 1, the subject invention has "a detachable wand comprising a central conducting rod supporting a sliding collar made of electrically conductive material ". The Examiner finds this feature in the description of col.7, line 30-col.8, line 43. However this segment of the disclosure indicates that " The conical insert 126 is desirably shaped to cooperate with the tapered opening 128 of the $\frac{1}{4}$ wave tube 90 and connect the $\frac{1}{4}$ wave center conductor 116, for instance, by soldering" (Please see col.7, lines 41-44).

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According to claim 1, the adjustable $\frac{1}{4}$ wave assembly comprises "contacts disposed on a periphery of said sliding collar for providing electrical contact with said tube when said detachable wand being inserted into said tube". However, according to Munsell, "The $\frac{1}{4}$ wave stick comprises a $\frac{1}{4}$ wave center conductor having a tip near a proximal end for electrically contacting the pair of electrical contacts and a shorting member near a distal end for electrical communication of the $\frac{1}{4}$ wave center conductor with $\frac{1}{4}$ wave tube" (Please see col.2, lines 51-56). Therefore the $\frac{1}{4}$ wave center conductor has a tip near a proximal end for electrically contacting the pair of electrical contacts, which means that the electrical contacts are not in a direct electrical contact with the tube. More over, the distal end does not form a sliding collar as requested by the claimed invention. The positioning of the shorting member of the $\frac{1}{4}$ wave stick and any adjustment of its position would be to insure that it makes good electrical contact with tapered opening 128.

Munsell et al design does not have a sliding collar/conical insert. Munsell's collar is fixed during manufacturing process (at the factory) to match the length of the tube to provide the contact with the tapered opening 128. No provision is made for adjusting the position of the shorting member of the position of the tapered opening 128 in tube 90. (Please see figures 17-19). Further according to the description, the collar/conical insert may be fixed to central rod 116 by soldering (Please see col. 7, lines 41-44). The short stub/conical insert 126 cannot be equated with the sliding collar of the present invention. The $\frac{1}{4}$ wave stick of Munsell et al is not adjustable. A separate $\frac{1}{4}$ wave extension stick must be used to change the double tune frequencies (Please see col. 8, lines 23-27).

Claim 2 further distinguishes the claimed invention and Munsell invention since the adjustable wand for double frequency operations is provided by in part by fastening or claiming the conductive collar at different positions along rod 11.

Claim 3 yet further distinguishes the claimed invention and Munsell et al invention. The capacitor stick of Munsell et al is screwed into the probe where one contact is made by capacitor 102 contacting piston 22 and another contact made by a spring clip 30 contacting standoff 106 (Please see Col. 6, lines 40-46). The $\frac{1}{4}$ wave stick is also screwed into the probe with one contact made by threaded contacts 18 and the other contact made by conical insert 126 contacting tapered opening 128 (Col. 7, lines 51-56). The Applicants believe that the person of the ordinary skills in the art would not contemplate this as a plug, whereas the present invention uses a conventional type of plug with electrical pins and an electrical socket for contacting these pins.

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With respect to claim 5, the $\frac{1}{4}$ wave stick/wand of Munsell et al does not contain any spring clips for mounting capacitors. The probe contains one spring clip 30 for contacting the capacitor stick standoff 106. (Please see Col. 6 lines 40-46).

Referring to claim 9, The present invention allows for switching the frequencies by switching capacitors in the wand and readjusting the position of the $\frac{1}{4}$ wave shorted stub. Munsell et al switches frequencies by interchanging capacitor sticks, $\frac{1}{4}$ wave sticks or $\frac{1}{4}$ wave extension sticks.

Claim 4 and 8 are dependent on the claims, which are believed to be distinguishable over Munsell et al in view of arguments presented above.

The Applicants respectfully request to withdraw the rejection of claim 1 and dependent thereon claims 2-6 and 8-9.

Claim Rejections - 35 U.S.C. § 103

The Examiner rejected claims 10-14 under 35 U.S.C. § 103(a) as being unpatentable over Munsell et al, US patent 5,982,179. The Applicants respectfully disagree with this rejection for the following reasons.

Claim 10 teaches the adjustable $\frac{1}{4}$ wave assembly that is not disclosed in the referenced patent. Munsell et al do not teach the adjustable $\frac{1}{4}$ wave assembly but rather use a separate assembly for each pair of frequencies.

Though admitting that Munsell et al does not teach the "contacts", the Examiner equates the components 18 and 122 with the "contacts" of the present invention. The Examiner further states that "the ability to modify the shape of the contacts, without changing the functionality of the device taught by Munsell et al would have been readily obvious to one of ordinary skill in the art at the time that the invention was made"

Applicants respectfully submit that the functionality of the referenced components is different in the Munsell device and claimed invention. Threaded contacts 18 and threaded tip 122 are utilized for the purpose of connecting the probe circuit to the center conductor 116, and are not a part of the sliding collar, which forms the shorting member of the $\frac{1}{4}$ wave shorted stub. The shortign stub of Munsell et al is a conical inset 126, which in operation fits snugly against tapered opening 128, thereby any adjustments of its position by sliding or otherwise would make it inoperable.

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Regarding claim 11, Applicants amended the claim by inserting —pin— before “contacts” to further clarify the claimed invention. The support for this amendment can be found in the specification. (Please see, for example, in the specification: page 4, line 13).

The Examiner refers to Figs 11, 16, and 20 to support the obviousness of claim 13 in view of these figures. The Applicants respectfully submit that Fig. 11 of Munsell et al is associated with the probe circuit and the $\frac{1}{4}$ wave tube fixed to it show capacitors C_0 , C_1 and C_2 . These are capacitors associated with the circuit and not the wand or capacitor stick.

Fig. 16 includes capacitor 102 of the capacitor stick. Fig. 20 has no additional capacitors but shows the connection 122 between threaded contacts 18 made by the $\frac{1}{4}$ wave stick and the connection 126 to rod 116. Munsell et al column 6, lines 23-26 suggests that capacitors C_0 , C_1 and C_2 are associated with the probe circuit and not the capacitor stick or $\frac{1}{4}$ wave stick.

The Examiner states with reference to claim 14 that Munsell et al teach “said electrical wiring includes spring clips for selectively mounting said wand” and cites Col. 6, line 4-Col. 7, line 5. Applicants respectfully disagree with this statement. The external capacitor 102 is not mounted in spring clip 30. One side of capacitor 102 is fixed to the end of the capacitor stick, and connected to standoff 106. Standoff 106 makes contact with spring clip 30 only when the capacitor stick is mounted in the probe. The other side of capacitor makes electrical contact to piston 22 only when the capacitor stick is mounted in the probe. Piston 22 and capacitor clip 30 make connections to probe coil 94 thereby lowering its resonant frequency when the capacitor stick is in place.

With respect to claim 15, the Examiner states that though Munsell et al “lacks directly teaching that ‘said wand further comprises electrical jumpers’ it would have been obvious to one of ordinary skill in the art at the time that the invention was made to modify the teaching of Munsell to include electrical jumpers on the detachable stick/wand, as the shorting member, which connects the distal end 150 of the extension tube 144 to the center conductor 116...”

It is respectfully submitted that using electrical jumpers as a means to connect the distal end 150 of the extension tube 144 to the center conductor 116 to short the extension tube as suggested by the Examiner would not be obvious to one of ordinary skill in the art. The shorted end of a $\frac{1}{4}$ wave circuit is at a high electrical current point, so any shorting mechanism must provide a very low resistance between the central rod and outer cylinder. This is achieved in the instant invention with a shorting stub and spring contacts to insure a good low resistance connection and the ability to tune

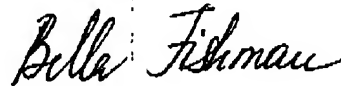
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the $\frac{1}{4}$ wave structure by repositioning the shorting stub. It is not clear how an electrical jumper would be connected to the central rod or the outer cylinder. If spring clips were used it is not clear how they would be fastened to either the central rod or to the outer cylinder. Generally jumpers are not known for making good low resistance connections and it is doubtful that one of ordinary skills in the art would use them to provide a good low resistance short in a $\frac{1}{4}$ wave structure. The electrical jumpers of the instant invention are made to fit securely into a spring clip, which alternatively may hold a capacitor or be left open.

It is believed that all issues raised by the Examiner were addressed. Applicants respectfully submit that independent claims 1 and 10 and claims dependent thereon are believed to be patentable over cited reference under 35 U.S.C. § 102(b) and § 103(a) and respectfully request that the rejection to these claims is withdrawn.

In light of the above amendments and remarks, it is respectfully submitted that the present application is now in proper condition for allowance, and an early notice to such effect is earnestly solicited.

Respectfully submitted,



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